AMENDMENTS TO THE CLAIMS

A listing of all claims and their current status in accordance with 37 C.F.R. § 1.121(c) is provided below.

1. (currently amended) A process for olefin oligomerization in a reactor, the process comprising:

providing a reaction mixture in the reactor, the reaction mixture comprising:

at least one reactant comprising at least one olefin monomer and optionally hydrogen, wherein the olefin monomer comprises ethylene; and

a catalyst system suitable for the oligomerization of olefin monomers;

contacting the olefin monomer and the catalyst system in a reaction zone;

monitoring an olefin oligomerization reaction by using low-resolution Raman spectrometry equipment to provide an output signal representative of one or more chemical components of the reaction, wherein the oligomerization reaction comprises a trimerization reaction; and

recovering an oligomer, wherein the oligomer comprises 1-hexene.

2. (previously presented) The olefin oligomerization process of claim 1, wherein the output signal is representative of a concentration of one of the reactants or the oligomer.

3. (previously presented) The olefin oligomerization process of claim 1, comprising adjusting the olefin oligomerization reaction in response to the output signal provided by the Raman spectrometry equipment.

4. (previously presented) The olefin oligomerization process of claim 1, wherein the olefin oligomerization reaction is adjusted by adjusting the amount within the reaction mixture of at least one of the reactants, the oligomer or the catalyst system.

5. (previously presented) The olefin oligomerization process of claim 1, wherein the Raman spectrometry equipment is operatively connected to a Raman fiber optic probe that is in contact with the olefin oligomerization reaction or the oligomer.

6. (cancelled).

7. (cancelled).

8. (previously presented) The olefin oligomerization process of claim 1, wherein the low resolution Raman spectrometry equipment has a resolution in the range of from about 15 wavenumbers to about 30 wavenumbers.

9. (previously presented) The olefin oligomerization process of claim 1, wherein the reactants comprise hydrogen.

10. (cancelled)

11. (cancelled)

12. (previously presented) The olefin oligomerization process of claim 1, wherein the process is performed in two or more reactors connected in series, wherein effluent from an upstream reactor is provided as input to a downstream reactor, wherein the monitoring comprises determining a concentration of the monomer in the effluent by the Raman spectrometry equipment, and comprising adjusting an amount of monomer or comonomer fed to the downstream reactor.

13-29. (cancelled).

30. (currently amended) A trimerization process for producing 1-hexene, the process comprising:

monitoring a trimerization reaction of ethylene monomer by using Raman spectrometry equipment, wherein the Raman spectrometry equipment comprises low resolution Raman spectrometry equipment; and

recovering 1-hexene from the trimerization reaction.

31. (previously presented) The trimerization process of claim 30, comprising adjusting a condition of the trimerization reaction in response to an output signal provided by the Raman spectrometry equipment.

32. (currently amended) The trimerization process of claim 31, wherein adjusting the trimerization reaction condition comprises adjusting an amount of [[an]] the ethylene monomer, a catalyst system, or the 1-hexene, or any combination thereof, in response to the output signal.

33. (previously presented) The trimerization process of claim 30, wherein the Raman spectrometry equipment comprises a Raman fiber optic probe adapted to contact the trimerization reaction.

34. (cancelled).

35. (previously presented) The trimerization process of claim 30, wherein the low resolution Raman spectrometry equipment has a resolution in the range of from about 15 wavenumbers to about 30 wavenumbers.

36. (currently amended) The trimerization process of claim 30, wherein the trimerization reaction comprises the ethylene monomer, a catalyst system, and hydrogen.

37. (currently amended) The trimerization process of claim 30, wherein the process is performed in two or more reactors connected in series, wherein effluent from an upstream reactor is provided as input to a downstream reactor, wherein the monitoring comprises determining a concentration of [[an]] the ethylene monomer in the effluent by the Raman spectrometry equipment, and comprising providing an amount of the ethylene monomer in addition to the effluent to the downstream reactor in response to the determined concentration of the ethylene monomer in the effluent.

38. (cancelled).

39. (cancelled).

40. (new) The trimerization process of claim 30, wherein monitoring the trimerization reaction comprises determining an amount of conversion of the ethylene monomer to the 1-hexene by using the low resolution Raman spectrometry equipment

41. (new) A process for trimerization of ethylene monomer to produce 1-hexene, the process comprising:

contacting the ethylene monomer, a catalyst system, and optionally hydrogen in a reaction mixture; and

monitoring the trimerization of the ethylene monomer by using low-resolution Raman spectrometry equipment to provide an output signal representative of at least one chemical component in the reaction mixture.

42. (new) The method of claim 41, wherein the at least one chemical component comprises the ethylene monomer or the 1-hexene, or a combination thereof.